

## REMARKS

This application has been reviewed in light of the Final Office Action mailed September 25, 2007 and the Advisory Action mailed November 27, 2007.

Independent Claims 1, 12, and 23 have been amended. Claims 1-29 are pending in the application. No new matter has been added. The Examiner's reconsideration of the rejections in view of the following remarks is respectfully requested.

Claims 1, 4, 5, 10-12, 15, 16, 21-23, and 26 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,311,150 to Ramaswamy (hereinafter "Ramaswamy"). Claims 2, 3, 6, 13, 14, 17, 24, and 25 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Ramaswamy in view of U.S. Patent No. 4,974,191 to Amirghodsi (hereinafter "Amirghodsi"). Claims 7-9, 18-20, and 27-29 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Ramaswamy in view of Ramaswamy, "A Pervasive Conversational Interface for Information Interaction, Eurospeech 1999 (hereinafter "Ramaswamy2").

As noted above, independent Claims 1, 12, and 23, which are all of the independent claim in the instant application, have been amended. Support for the amendments may be found at least at page 8 of the Applicants' Specification.

It is respectfully asserted that Ramaswamy does not teach or suggest "comparing an utterance to a plurality of handlers; identifying a winning handler for decoding a command from the utterance, wherein the winning handler is identified by arbitration between results provided by at least two of the plurality of handlers, and the results provided at a first stage by at least one of the at least two of the plurality of handlers include one or more target utterances for the

utterance; and decoding the command in accordance with the winning handler”, as recited in Claim 1.

Moreover, it is respectfully asserted that Ramaswamy does not teach or suggest “providing a plurality of handlers trained to be responsive to given utterances; arbitrating against results provided by at least two of the plurality of handlers to determine a winning handler for an utterance, wherein the results provided at a first stage by at least one of the at least two of the plurality of handlers include one or more target utterances for the utterance; and decoding the command in accordance with the winning handler”, as recited in Claim 12.

Further, it is respectfully asserted that Ramaswamy does not teach or suggest “a dialog manager comprising a hierarchical ordering of handlers, each handler being trained to be responsive to decoded utterances wherein the dialog manager manages arbitration between results provided by the handlers to determine a winning handler for an utterance and decodes the command in accordance with the winning handler, wherein the results provided at a first stage include one or more target utterances for the utterance”, as recited in Claim 23.

The Examiner has cited column 2, lines 25-40 of Ramaswamy as disclosing the preceding limitations recited in Claims 1 and 12, reasoning, *inter alia*, “scores for the probability of a correct translation are determined for at least two categories, then the category having the highest score is chosen and a formal command is output” (Office Action, pp. 3 and 5), and “scores for the probability of a correct translation are determined for at least two categories, then the category having the highest score is chosen and a formal command is output”(Office Action, pp. 3 and 5).

The Examiner has cited column 2, lines 25-40 and column 3, lines 10-20 of Ramaswamy as disclosing the preceding limitations recited in Claim 23, reasoning, *inter alia*, “the system includes a hierarchical configuration of translator, with many categories of models at each level. The models are trained using data from a domain of inputs” (Office Action, p. 6).

The Applicants respectfully disagree with the Examiner reading of Ramaswamy.

For example, column 2, lines 25-40 of Ramaswamy disclose the following:

Another method for hierarchical translation of input to a formal command in a natural language understanding system includes the steps of presenting an input command to be translated to a natural language understanding engine, providing a plurality of translator levels in the natural language understanding engine, providing a plurality of categories for each translator level, each category including a group of formal language commands stored in at least one model, associating the input command with the categories for a given translator level, scoring a probability of correct translation for each of the at least two categories, selecting a category of the at least two categories yielding a highest score, associating the input command with the selected category for a next level of translators and outputting a formal language command for the input command from a last of the translator levels based on the input command and the selected category.

Moreover, column 3, lines 10-20 of Ramaswamy disclose the following:

A method for building hierarchical models for translating an input command to a formal command in a natural language understanding system includes the steps of collecting training data from a domain of inputs, separating the training data into translation levels, the translation levels arranged to provide a given output at each level for associating the inputs to a category, the training data including the inputs and an associated formal language command for each input, for each translation level, indicating categories for searching for a formal language command by dividing up a formal language command search space and associating the categories with each input and associating each input with the formal language command in a last translation level.

Thus, in accordance with the limitations recited in Claims 1 and 12, “the results provided at a first stage by at least one of the at least two of the plurality of handlers include one or more target utterances for the utterance”. Moreover, in accordance with the limitations of Claim 23, “the results provided at a first stage include one or more target utterances for the utterance”.

In contrast, Ramaswamy does not teach or suggest the preceding limitations of Claims 1, 12, and 23, but instead involves a multi-tiered approach that, at a first stage, only outputs a target category for an utterance, but not a target utterance. From the target category, further stages are performed including in a further stage scoring a probability of a correct translation for each of at least two categories, in a yet further stage selecting a category yielding a highest

score, in a still further stage associating the input command with the selected category, and in a final state outputting a formal language command based on the input command and the selected category (see, e.g., Ramaswamy, col. 2, lines 25-40).

Hence, the approach of Ramaswamy is significantly more complex in all cases, thus requiring more time and resources to achieve a result. In contrast, the present principles as represented by Claims 1, 12, and 23 provide a more efficient approach.

Moreover, in accordance with the limitations recited in Claims 1 and 12, a winning handler is identified for decoding a command from an utterance by arbitration between results provided by at least two of the plurality of handlers. Moreover, in accordance with the limitations recited in Claim 23, a dialog manager manages arbitration between handlers to determine a winning handler for an utterance.

In contrast, Ramaswamy does not teach or suggest the use of arbitration at all, but rather simply selects the category with the highest score. While the Examiner has stated that the Applicant's Specification does not support the definition of arbitration provided in the previous response (and herein), the Examiner is respectfully requested to reconsider the same, as the portions of the specification explicitly supporting the definition are also included and clearly show such support. For example, as mentioned with respect to page 14, lines 11, one of two or more handlers may pose the question to another one of the two or more handlers "will you defer". Clearly, such an approach is not strictly score based as is Ramaswamy (highest score selected), but rather involves some discretion. The following is further provided with respect to arbitration not being disclosed in Ramaswamy.

As defined in Webster's New World Dictionary of the American Language, Second College Edition, David B. Guralnik, Ed. in Chief, 1974, p. 70, a copy of which is attached hereto for the Examiner's convenience, arbitration refers to "the act of arbitrating; specif., the settlement of a dispute by a person or persons chosen to hear both sides and come to a decision". Also noteworthy, as defined at page 70 of the same, arbitrator refers to "1. a person selected to judge a dispute; arbiter, esp. one, as in collective bargaining negotiations, named with the consent of both sides 2. a person authorized to judge or decide", and arbitrary refers to "not fixed by rules but let to one's judgment or choice; discretionary". Hence, in arbitration, a person or thing acts as a judge to make a choice based on discretion. In contrast, Ramaswamy is not performing arbitration, i.e., is not using discretion, but is instead simply determining a highest scoring category which is hence rule-based (rule = select highest scoring category) and contrary to arbitration. That is, if a rule is simply to be followed (i.e., select highest scoring category) as disclosed in Ramaswamy, then arbitration is not even needed in the first place.

For example, as disclosed in the Applicants' Specification, with respect to an arbitration method (see, e.g., Applicants' Specification, p. 6, lines 7-8, and p. 12, line 30 to p. 13, line 2), a first stage of arbitration may involve posing the question "Do you understand this utterance?" to each handler (Applicants' Specification, p. 13, lines 7-11), a second state of arbitration may involve posing the question "Did you expect this?" to each handler that responded to the question posed in the first stage (Applicants' Specification, p. 13, line 19 to p. 14, line 2), and another state of arbitration may involve posing the question "Will you defer" to each of two or more handlers that still express interest in the utterance (Applicants' Specification, p. 14, lines 11-13), and so forth. Hence, each of Claims 1, 12, and 23 expressly recite identifying the

winning handler by arbitration, which may involve, for example, a negotiation and so forth between the handlers, and not simply the application of a rule (rule = select highest scoring category) as disclosed in Ramaswamy.

Moreover, while Claims 1, 12, and 23 recite identifying/determining a winning handler, the cited portion of Ramaswamy discloses selecting a category (and not a winning handler as recited in these claims). As disclosed at page 8, lines 11-17 of the Applicants' Specification, a handler is a component of a dialog management system that interprets utterances, and not simply a category.

Further, while Claims 1, 12, and 23 recite that the command is decoded in accordance with the winning handler identified by arbitration, the cited portion of Ramaswamy discloses that the category yielding the highest score is selected, the input command is associated with the selected category for a next level of translators, and the formal language command for the input command is outputted from a last of the translator levels based on the input command and the selected category. Hence, even assuming arguendo that Ramaswamy selected a handler (e.g., translator level) as opposed to a category, Ramaswamy would still not teach or suggest the above-recited limitations of Claims 1, 12, and 23 since Ramaswamy does not output a formal language command corresponding to that handler (translator level) but rather then associates the selected category with a next level of translators and ultimately outputs the formal language command from a last level of translators.

Accordingly, Ramaswamy does not teach or suggest all the above-recited limitations of Claims 1, 12, and 23. Moreover, while not cited against Claims 1, 12, and 23, it is nonetheless respectfully asserted that Amirghodsi and Ramaswamy<sup>2</sup> do not cure the deficiencies of

Ramaswamy, and are silent with respect to the above-recited limitations of Claims 1, 12, and 23.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” MPEP §2131, citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Thus, Claims 1, 12, and 23 are patentably distinct and non-obvious over the cited references for at least the reasons set forth above.

“To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art” (MPEP §2143.03, citing *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)). “If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious” (MPEP §2143.03, citing *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)).

Claims 2-11 depend from Claim 1 or a claim which itself is dependent from Claim 1 and, thus, includes all the elements of Claim 1. Claims 13-29 depend from Claim 12 or a claim which itself is dependent from Claim 12 and, thus, includes all the elements of Claim 12. Accordingly, Claims 2-11 and 13-29 are patentably distinct and non-obvious over the cited references for at least the reasons set forth above with respect to Claims 1 and 12, respectively.

Moreover, said dependent claims include patentable subject matter in and of themselves and are, thus, patentable distinct and non-obvious over the cited references in their own right. For example, the Applicants still maintain their position that none of the cited references teach or suggest “submitting the utterance to disabled container handlers to ensure submission of the



utterance to child handlers”, as recited in Claims 5 and 16. The Examiner has cited column 8, lines 45-64 of Ramaswamy as disclosing the preceding limitations of Claims 5 and 16, reasoning “thresholding is used to determine the number of categories from the top choice from a particular translation level that will be used in the next translation level. If the top choices don’t exceed a threshold, then the next top choices are used as categories in the next level translation” (Office Action, p. 4). The Applicants respectfully disagree with the Examiner’s reading of Ramaswamy.

Claims 5 and 16 essentially recite that a container handler that is disabled and hence, is not participating in decoding the utterance with the enabled handlers, will nonetheless have the utterance submitted there to (i.e., to that container handler) to ensure that the utterance is submitted to child handlers of the disabled container handler. In contrast, the cited portion of Ramaswamy simply discloses the use of a threshold to determine the number of categories such that only the top choice for a particular translation level is considered when the top choice exceeds a threshold, otherwise two or more top choices are combined so that the combined score exceeds the threshold. As is evident, there is no disclosure in Ramaswamy relating to a disabled container handler as recited in Claims 5 and 16, let alone any disclosure relating to nonetheless submitting an utterance to a disabled container handler to ensure submission of the utterance to child handlers, as recited in Claims 5 and 16. Accordingly, Ramaswamy does not teach or suggest the preceding limitations of Claims 5 and 16.

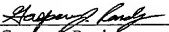
Thus, reconsideration of the rejections under 35 U.S.C. §102 and 35 U.S.C. §103 is requested.

In view of the foregoing amendments and remarks, it is respectfully submitted that all the claims now pending in the application are in condition for allowance. Early and favorable reconsideration of the case is respectfully requested.

Please charge the fee for a RCE to applicant's IBM Deposit Account No. 50-0510. If any further fees are required, please also charge the same to the applicant's IBM Deposit Account No. 50-0510.

Respectfully submitted,

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